

AUSTRALIAN PATENT OFFICE

SEARCH REPORT

Applicant's or agent's file reference CG/RFCH(LYX)/PAT/8112863/SG		
Application No. SG 200301781-1	Application Filing Date (<i>day/month/year</i>) 20 July 2001	(Earliest) Priority Date (<i>day/month/year</i>) 20 July 2000
Applicant OHIO STATE UNIVERSITY		

This search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I)
2. ☐ Unity of invention is lacking (See Box II)
3. ☐ The application contains disclosure of a **nucleotide and/or amino acid sequence listing** and the search was carried out on the basis of the sequence listing
 - ☐ filed with the application
 - ☐ furnished by the applicant separately from the application,
 - ☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in application as filed
4. With regard to the **title**, ☒ the text is approved as submitted by the applicant.
 - ☐ the text has been established by this Office to read as follows:
5. With regard to the **abstract**, ☒ the text is approved as submitted by the applicant
 - ☐ the text has been established by this Office as it appears in Box III
6. The figure of the **drawings** to be published with the abstract is Figure No. 1
 - ☒ as suggested by the applicant.
 - ☐ because the applicant failed to suggest a figure
 - ☐ because this figure better characterises the invention
 - ☐ None of the figures

A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC)

Int. Cl.

A61B 3/107 (2006.01) A61F 9/007 (2006.01)

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the search (name of data base and, where practicable, search terms used)

DWPI: IPC: A61B 003, A61F 009, G06F 019, A61B 017; Keywords: Eye, ophthalmic, cornea, photorefraction, ablation, laser, keratectomy, keratomileusis, LASIK, PRK, incise, sever, cut, perturb, predict, model, theoretical, estimate, expect, observe, measure, outcome, result, effect, response, adjust, compare, change, alter, thickness, topography, wavefront, pachymetric, pressure, biodynamic, computer and similar words

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 1994/018636 A2 (ARIZONA BOARD OF REGENTS) 18 August 1994 See in particular abstract; page 4, line 7 – page 6, line 20	1-59
A, P	WO 2001/077739 A2 (JEAN et al) 18 October 2001 See in particular abstract;	1-59
A, P	WO 2002/069787 A1 (HALPERN) 12 September 2002 See entire document	1-59

☐ Further documents are listed in the continuation of Box C

☒ See patent family annex

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of submission of the request to the Australian Patent Office 5 December 2005	Date of completion of the search report 30 January 2006	Date of mailing of the search report 08 FEB 2006
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Name and mailing address AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. 61 2 62853929	Authorised officer MATTHEW FORWARD
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Patent Document Cited in Search Report		Patent Family Member	
WO	9418636	US	5891131
WO	0177739	AU	60197/01
		EP	1274341
		US	2004223118
WO	02069787	US	6582078
		US	2002154270
<p>Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.</p> <p>END OF ANNEX</p>			

AUSTRALIAN PATENT OFFICE

WRITTEN OPINION

		Date of mailing <i>day/month/year</i> 08 FEB 2006
Applicant's or agent's file reference CG/RFCH(LYX)/PAT/8112863/SG		REPLY DUE within FIVE MONTHS of the date of the Registrar's letter enclosing the written opinion
Application No. SG 200301781-1	Application Filing Date (<i>day/month/year</i>) 20 July 2001	Priority Date (<i>day/month/year</i>) 20 July 2000
International Patent Classification (IPC) (as indicated in the search report) Int. Cl. A61B 3/107 (2006.01) A61F 9/007 (2006.01) Action Date: 30 January 2006		
Applicant OHIO STATE UNIVERSITY		

1. This First written opinion consists of a total of 5 sheets.
2. This opinion contains indications relating to the following items:

I	<input checked="" type="checkbox"/>	Basis of the opinion
II	<input type="checkbox"/>	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
III	<input type="checkbox"/>	Lack of unity of invention
IV	<input checked="" type="checkbox"/>	Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
V	<input type="checkbox"/>	Certain documents cited
VI	<input type="checkbox"/>	Certain defects in the application
VII	<input checked="" type="checkbox"/>	Certain observations on the application
3. This opinion is based upon the assumption that the priority claim is valid.
4. The search report used was issued by the **Australian Patent Office**, and the date of completion is: **30 January 2006**
5. If no reply is filed, the examination report will be established on the basis of this opinion.
6. The date by which the examination report will be established is: **28 June 2007**

Name and mailing address AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile no. 61 2 62853929	Authorized Officer MATTHEW FORWARD
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1. This opinion has been drawn on the basis of:

- ☒ the application as originally filed.
- ☐ the description, pages , as originally filed,
 pages , filed with the request,
 pages , received on with the letter of
- ☐ the claims, pages , as originally filed,
 pages , filed with the request,
 pages , received on with the letter of
- ☐ the drawings, sheets/fig. , as originally filed,
 sheets/fig. , filed with the request,
 sheets/fig. , received on with the letters of
- ☐ the sequence listing part of the description:
- pages , as originally filed
 pages , filed with the demand
 pages , received on with the letter of

2. The amendments have resulted in the cancellation of: pages:
..... sheets of drawings/figures No :

- 3 ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box.

4. Additional observations, if necessary:

IV. Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	YES
	Claims 1-59	NO
Inventive step (IS)	Claims	YES
	Claims 1-59	NO
Industrial applicability (IA)	Claims 1-59	YES
	Claims	NO

2. Citations and explanations

The following documents identified in the International Search Report have been considered for the purpose of this report:

D1: WO 1994/018636

D2: WO 2001/077739

D3: WO 2002/069787

NOVELTY claims 1-59:

1. **Claims 1-59 are not novel when compared with document D1 which discloses all the essential features of the invention claimed.**

WO 1994/018636 discloses a technique for automated design of a corneal surgical procedure including obtaining pre-operative topographical measurements of a patient's eye to obtain corneal surface topography such as thickness and intraocular pressure. This data is interpolated and extrapolated to fit the nodes of a finite element analysis mode of the eye to determine an ablation or incision specification. Post-operative values of the cornea are computed and a new analysis is then performed to simulate resulting deformations, stresses, and curvatures of the eye. These values are compared to the original values and if necessary, the surgical plan is modified until the vision objectives are met.

WO 2001/077739 discloses a method and system for measuring and mapping the anterior surface of a cornea including determining corneal surface topography to provide guidance for corneal reshaping. A virtual image of the topographic surface may be combined with virtual components of the optical system to determine the extent of the required corneal ablation. The system provides a simulation of a prospective ablation process with real-time visual feedback, a means for altering the virtual surface, and accurately portrays results of the topographic surface alteration that would occur during an actual ablation procedure. The difference between this document and the current invention is that the procedure is simulated and no corneal lamella are severed.

Continued on Supplemental Sheet

VII. Certain observations on the application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- ☒ The claimed invention is patentable according to Section 13(2); or
- ☐ The claimed invention is unpatentable according to Section 13(2) because:

Supplemental Box

(To be used when the space in any of Boxes I to VII is not sufficient)

Continuation of Box IV:

WO 2002/069787 discloses a tool to assist surgeons in preparing a preoperative plan for refractive eye surgery which includes receiving pre-perturbation data such as corneal topography, determining precise corrective settings for the laser equipment, and outputting the precise corrective settings along with recommendations for the surgical procedure. There is no disclosure of receiving post-perturbation data and using it to control one or more aspects of the system.

INVENTIVE STEP (IS) claims 1-59

All the essential features of claims 1-59 are disclosed in document D1 and therefore do not involve an inventive step.

Industrial applicability (IA) claims 1-59

Claims 1-59 are directed to a computer implemented method for controlling an ophthalmic photoablative laser system and are thus industrially applicable.